

CLAIMS

What is claimed is:

1. An optical pickup condenses a light emitted from a light source using an objective lens and irradiates the light on an optical recording medium to record data on the optical recording medium and/or to reproduce the data recorded on the optical recording medium, the optical pickup comprising:

an optical element adjusting a convergence and/or a divergence of the light emitted from the light source and proceeded to the objective lens.

2. The optical pickup of claim 1, wherein the optical element is a hologram optical element that adjusts the convergence and/or the divergence of the incident light.

3. The optical pickup of claim 1, further comprising:
a collimating lens to convert the light emitted from the light source into a parallel light after passing through the collimating lens and the optical element.

4. The optical pickup of claim 3, wherein the collimating lens has a focal length of 14 mm or less.

5. The optical pickup of claim 3, wherein the optical pickup has a slim structure.

6. The optical pickup of claim 3, wherein the optical element is disposed between the light source and the collimating lens.

7. The optical pickup of claim 6, further comprising:
a beam shaping device disposed between the collimating lens and the objective lens to shape the light.

8. The optical pickup of claim 3, further comprising:
a beam shaping device disposed between the collimating lens and the objective lens to shape the light.

9. The optical pickup of claim 3, wherein the light source comprises a plurality of light sources to emit the light having different wavelengths and the optical element adjusts the convergence and/or the divergence of the light emitted from at least one of the plurality of light sources so that the optical pickup is compatible for a plurality of optical recording media having different formats.

10. The optical pickup of claim 1, wherein the optical pickup has a slim structure.

11. The optical pickup of claim 1, wherein the light source comprises a plurality of light sources to emit the light having different wavelengths and the optical element adjusts the convergence and/or the divergence of the light emitted from at least one of the plurality of light sources so that the optical pickup is compatible for a plurality of optical recording media having different formats.

12. An optical recording and/or reproducing apparatus that records data on an optical recording medium and/or reproduces the data recorded on the optical recording medium, the apparatus comprising:

a light source emitting a light;

an objective lens;

an optical pickup condensing the light emitted from the light source using the objective lens and irradiating the light on the optical recording medium,

wherein the optical pickup comprises an optical element to adjust a convergence and/or a divergence of the light emitted from the light source and proceeding to the objective lens.

13. The optical recording and/or reproducing apparatus of claim 12, wherein the optical element is a hologram optical element that adjusts the convergence and/or the divergence of the incident light.

14. The optical recording and/or reproducing apparatus of claim 12, wherein the optical pickup comprises a collimating lens to convert the light emitted from the light source into a parallel light after passing through the collimating lens and the optical element.

15. The optical recording and/or reproducing apparatus of claim 14, wherein the collimating lens has a focal length of 14 mm or less.

16. The optical recording and/or reproducing apparatus of claim 14, wherein the optical pickup has a slim structure.

17. The optical recording and/or reproducing apparatus of claim 14, wherein the optical element is disposed between the light source and the collimating lens.

18. The optical recording and/or reproducing apparatus of claim 17, wherein the optical pickup further comprises a beam shaping device disposed between the collimating lens and the objective lens to shape the light.

19. The optical recording and/or reproducing apparatus of claim 14, wherein the optical pickup further comprises a beam shaping device disposed between the collimating lens and the objective lens to shape the light.

20. The optical recording and/or reproducing apparatus of claim 14, wherein the light source comprises a plurality of light sources to emit the light having different wavelengths and the optical element adjusts the convergence and/or the divergence of the light emitted from at least one of the plurality of light sources so that the optical pickup is compatible for a plurality of optical recording media having different formats.

21. The optical recording and/or reproducing apparatus of claim 12, wherein the optical pickup has a slim structure.

22. The optical recording and/or reproducing apparatus of claim 12, wherein the light source comprises a plurality of light sources to emit the light having different wavelengths and the optical element adjusts the convergence and/or the divergence of light emitted from at least one of the plurality of light sources so that the optical pickup is compatible for a plurality of optical recording media having different formats.

23. An optical pickup of an optical disc, comprising:
a light source emitting a light;
an objective lens focusing the light emitted from the light source and irradiating the light on the optical disc;

a collimating lens making the light emitted from the light source into a parallel light; and
an optical element adjusting a convergence and/or a divergence of the light so that the light passing through the collimating lens and proceeding to the objective lens is a parallel light or approximate to the parallel light.

24. The optical pickup of claim 23, wherein the light source comprises an edge emitting laser or a vertical cavity surface emitting laser to emit the light having a predetermined wavelength.

25. The optical pickup of claim 23, further comprising:
an optical path changing device, wherein the collimating lens is disposed between the light source and the optical path changing device or between the optical path changing device and the objective lens so that the collimating lens focuses the divergent light emitted from the light source and makes the light into the parallel light.

26. The optical pickup of claim 23, wherein the collimating lens comprises a short focal length of 14 mm or less.

27. The optical pickup of claim 23, wherein the optical element comprises a hologram optical element disposed between the light source and the collimating lens.

28. The optical pickup of claim 23, wherein the light source emits the light having a wavelength of 655 nm and the objective lens comprises a numerical aperture of 0.6 or 0.65.

29. The optical pickup of claim 23, further comprising:
an optical path changing device, wherein the optical element and the collimating lens are disposed between the light source and the optical path changing device.

30. The optical pickup of claim 29, wherein the optical path changing device comprises a plate beam splitter.

31. The optical pickup of claim 30, further comprising:

a beam shaping device shaping the light, wherein the beam shaping device is disposed on an optical path of the light converted into the parallel light after passing through the optical element and the collimating lens.

32. The optical pickup of claim 31, wherein the collimating lens and the beam shaping device are disposed between the light source and the plate beam splitter so that the light reflected from the optical disc and passing through the plate beam splitter becomes the parallel light in a beam shaping state.

33. The optical pickup of claim 32, further comprising:
a grating splitting the light emitted from the light source into at least three light beams to detect a tracking error signal using a three-beam method.

34. The optical pickup of claim 33, further comprising:
a plate beam splitter; and
an optical path changing device, wherein the plate beam splitter, the collimating lens, and the beam shaping device are disposed between the plate beam splitter and the objective lens so that the light reflected from the optical disc, and passed through the plate beam splitter becomes the convergent light.

35. The optical pickup of claim 34, further comprising:
a photodetector; and
a concave lens forming a light spot on the photodetector and disposed between the plate beam splitter and the photodetector and inclined in a direction opposite to a direction in which the plate beam splitter is inclined, to remove coma aberration generated when the light reflected from the optical disc passes through the plate beam splitter.

36. The optical pickup of claim 33, wherein the grating and the optical element are installed separately.

37. The optical pickup of claim 33, wherein the grating and the optical element are formed in one united body.